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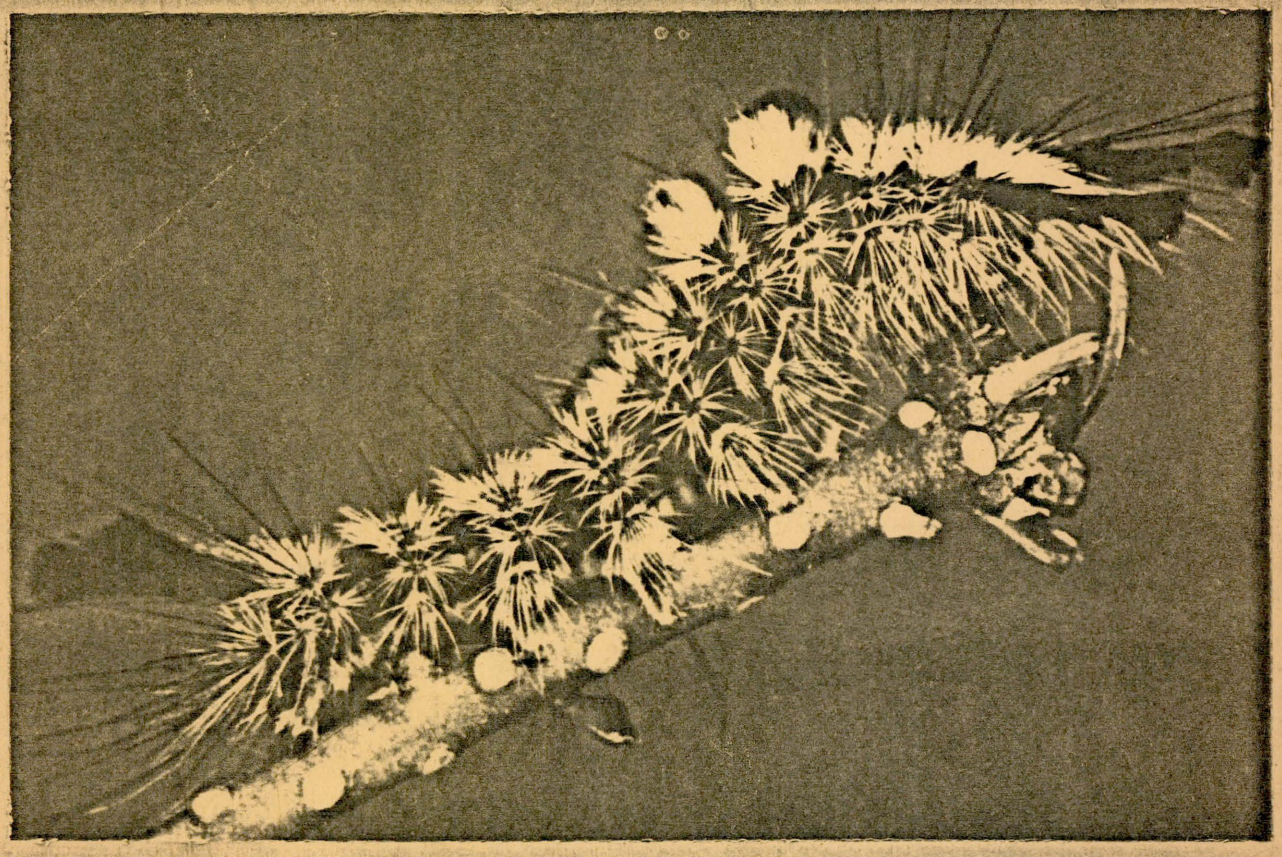
Report of Activities on the Pomeroy Unit of the 1974 Douglas-fir Tussock Moth Control Project

USDA - Forest Service
Region 6



compiled and summarized by
Dennis W. Martin
February, 1975

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
UMATILLA NATIONAL F...
HEPPNER RANGER DIST...
P. O. BOX 7
HEPPNER, OREGON ...

REPLY TO: 5240 Suppression
Due: 3/1/75

February 28, 1975

SUBJECT: 1974 DFTM Control Project Critique

TO: Staff Director, Insect & Disease Control

Attention: Jack Mounts

Attached is a rough report on our activities on the Pomeroy Unit for your information.

Also, as you requested in your memo of December 19, position descriptions as revised by those who filled the jobs during the project, are included in the appendix of the report. In addition, I also included individual critiques made just prior to completion of the project which you might find interesting even though most of the items were discussed during the Indian Hills session.

If you have any questions, give us a call.

DENNIS W. MARTIN
Supervisory Forester

Attachments:

This report is intended to summarize the functional procedures that were used on the Pomeroy Unit of the 1974 Douglas-fir Tussock Moth Control Project, highlight some of the more significant problems that occurred, and state the recommendations and critiques of the personnel who were responsible for performing the various duties involved.

It is not intended to be all encompassing, but rather to serve as a guide in approaching similar future projects and possible help to avoid some of the problems and pitfalls that were encountered in the Pomeroy Unit.

Considering all aspects of the project, the assigned personnel did an exceptional job of meeting the challenges that were presented, and adapting well to a totally new situation and working conditions.

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The purpose of this report is basically three-fold and includes a summation of the functional procedures that were used on the Pomeroy Unit, some of the significant problems that occurred, and probably most important, a critique of the project and composite recommendations as to how similar projects might be improved in the future. Hopefully, this report will serve as a guide and possibly help future project personnel avoid some of the pit falls that were faced on the 1974 DFTM Control Project.

I. ENTOMOLOGY

Block Layout

One of the first problems faced was in determining logical spray block boundaries and numbers. Criteria was well established in the project plan; however, the big problem was in coordination between spray operations and entomology. Block boundaries were mutually established on 1" planimetric maps based on insect survey data, but only consisted of a closed line that was impossible to recognize on the ground. Although the project entomologist tried to do some adjusting and assignment of numbers, there were still problems as spray operations were not initially involved.

The problem was finally resolved by sitting down with both the entomologist and spray operations assistant and transfering the blocks to 7½ min. topography maps with vegetation patterns, and adjusting the boundaries to fit prominent terrain features. The only problem that remained was adjusting the numbering system to fit the egg hatch and cluster plots that had been previously established.

Another problem area involved with spray block location was treatment of areas that were probably non-commercial forest or at best marginal. It appeared that little consideration was given to the relative values involved in treating these areas as opposed to cost-benefit. Again this was a problem that was not resolved.

Egg Hatch Evaluation

There appeared to be a number of problems involved in egg hatch evaluation including finding enough viable egg masses to establish plots and locating plots in all blocks that would be indicative of the hatch by aspect and elevation. Access was a real problem as a number of the plots were in back country areas, and obviously it was difficult and time consuming to examine these areas. This problem was never adequately resolved.

An additional problem was in training the biological aids to first recognize viable egg masses as opposed to old, and secondly to be able to observe when the eggs had hatched. After collecting some erroneous data, this problem was resolved through closer supervision and additional training.

Cluster Plot Evaluation

There were not as many problems associated with cluster as egg hatch plots, although some of the same access problems did exist. These plots were initially established by the assistant entomologist, and then read by the various biological aids. Elk tended to like the tags used to mark the clusters which resulted in some problems in finding the plots to make readings.

As the clusters were established on a grid basis using random numbers, they appeared to provide a good indication of insect population and it was through making pre-spray readings that population collapse was first noted. Final determination of collapse was based on reading all the clusters that were left in the non-spray blocks.

Population Collapse

Even after much discussion, the reason for collapse is not evident. One theory that may have some merit is that the weather conditions caused the larvae development to somehow get out of synchronization with the current years needle growth. Bud burst initially occurred in some areas in May and then another cold period ensued. When egg hatch finally occurred, the new growth was already going and even began to harden off when the larvae were in the first and second instars. Possible, due to these conditions, the larvae starved to death. In fact some of the larvae found that were in the fifth and sixth instars were much smaller that normal. At any rate, no incidence of virus was observed by the unit entomologist or biological aids.

Recommendations

1. Not necessarily related to entomology, but the Pomeroy Unit illustrates the need for intensive land use planning particularly as related to approaches in back country areas. Although we did not spray these areas as planned, treatment was of doubtful benefit when compared against cost, risk and timber values.

2. Initially (prior to EPA involvement) block boundaries should be put on 7½ min. topographic maps with vegetation patterns along logical topographic boundaries instead of arbitrarily drawing a line on a map at mid-slope or some other non-functional area.

3. A system should be developed that would permit an eleventh hour elevation of population levels, instead of having to rely on cluster plots and other non-standardized procedures.

4. More intensive effort should be put into establishing egg hatch plots in all blocks, and not just those with the best access. With the use of helicopters, there are really very few areas where plots could not be established.

II. SPRAY OPERATIONS

Heliport Locations

Location of heliports were based on three basic types of criteria, one being access by all-weather roads and the other was size that permitted use by helicopters of the Bell 205A class, and the third was to minimize flight distance to two miles.

The first two criteria were easily met; however, the third was impossible to meet due to the blocks in the Wenaha Back Country where six or seven miles ferry distance were common.

As it turned out, the original number of heliports were not adequate to do the most efficient job of spraying particularly since small helicopters of the Hiller 12-E class were used. Consequently, on the blocks sprayed additional helispots were added to minimize the ferry distance. The only real problem generated was that adding these at the eleventh hour caused some confusion which of course is normal in any crisis management situation.

In the Idaho spray blocks, lease agreements were needed for all heliport locations as no public land was involved. Also a number of agreements were needed for some of the Washington blocks. Generally speaking there was little trouble in obtaining these agreements and only two wanted reimbursement. One very positive effect was that contacting these landowners provided additional I & E involvement and helped clear up some misunderstandings about the control program.

Access

Unfortunately, due to the heavy snow year, access both for spray and entomological operations was a real problem. This was anticipated early in the program and an equipment rental agreement was set up with the State of Washington to plow the designated all weather roads. Although the idea was good, the State tried to do the job with a small rotary that was not capable of plowing the type and depth of snow involved.

We then learned from our Safety Officer that the Gifford Pinchot had a rotary plow and a detail was set-up which turned out very well. Approximately 40 miles were plowed which included two minor agreements with logging contractors for plowing a few small segments of road.

Insecticide

In general, storage facilities for insecticide were excellent. Three eight thousand gallon tanks were placed at headquarters in Clarkston where there was minimum exposure to unauthorized contact, close proximity to operations, and adequate security both during working and off duty hours. The only problem that developed was that two of the tanks were found to have small leaks which required that the insecticide be pumped out and the holes repaired before they could be used.

The spray application contractor had four tank trucks which he used on the contract. His basic procedure was to a 4600 gallon tanker as a "nurse" truck to transport insecticide from Clarkston to a central point and then transfer to the smaller tankers for movement to the heliports. Again, no particular problems occurred with the excpetion of minor leaks that developed in 3 of the tankers.

Each loaded tanker was piloted at all times by normally one of the load checkers. This was considered essential to maintain accountability and to insure the tankers actually made it to the heliport when needed.

As a precautionary measure, local fire departments and law enforcement agencies were contacted and informed of the insecticide storage and the potential problems involved.

Contracting

Some of the biggest problems were in the area of contracting, including both spray application and observation.

As far as the actual spraying application contract was concerned, there were actually very few problems involved other than that large helicopters of the Bell 205A or 206B class should have been specified for the Pomeroy Unit. As mentioned earlier, some of the back country blocks, had they been treated, involved up to seven miles ferry in one direction. The Hiller 12-E's were only capable of hauling 45 gallons of insecticide and could cruise at about 70 mph, which would have caused some real problems concerning accomplishment. (Inexperienced pilot-not enough helicopters).

The biggest problem involved one of the observation contractors who arrived on the job with very poor equipment. There were a number of problems ranging from inferior radio equipment to inexperienced pilots to obsolete and poorly maintained helicopters. It is quite doubtful that had the entire planned acres needed spraying that a serious accident would not have occurred. As it turned out there was one major accident that could have been disastrous had it occurred over more rugged terrain.

On the other hand there were no problems with the other observation contractor in any respect. (Inspection and/or standards for aircraft and pilots).

Spray Application

Load Calculation. Based on new Regional direction, load calculation forms had to be completed prior to any planned aerial flight. This policy, while excellent in most respects, did generate some problems. The biggest was lack of direction and training in how to actually fill out the form. As its use was relatively new, none of the operations personnel were sure as to the proper procedure even though most had a number of years of experience in air operations.

Another area of conflict was using the load calculation procedures for the spray helicopters, as most felt that the use of FAA requirements would have been more appropriate as no Forest Service personnel were involved or riding in these ships.

Observation. The major problem involved in observation of spray operations was that the original project plan seemed to indicate that all spray ships would be under observation at all times. Particularly, when using the small helicopters such as the 12-E's, this was virtually impossible. This problem probably generated the most conflict with the Unit EPA observer.

The only other problem involved was that in one or two instances the observers failed to shut off spraying soon enough when weather conditions were unfavorable. This caused some minor excessive drift, although little unfavorable environmental damage occurred.

Spray Patterns. Due to extremely rough topographic conditions, spray patterns were difficult to establish. Because of the topography, contour flying was normally necessary to meet spray application requirements. Obviously, some problems were inherent in this type of flying including keeping track of the location of the other helicopters, flying in and out of the sun, observer observation of ships, and just basically a potentially dangerous situation. The crash that occurred of June 23 was at least partially attributed to these problems.

Spray Deposit Evaluation. Evaluation was accomplished basically as outlined in the project plan developed for all the units, and very few problems occurred. Access was difficult in some blocks and card checkers were flown in and/or out in some cases. Apparently calibration was fairly adequate, as the cards normally indicated an application rate of .2 to .6 gallon per acre. Some minor problems ensued particularly when daily operations were terminated in the middle of a block, and when spraying commenced on the next day, some areas were skipped while others were hit twice and some cards indicated up to 2.0 gallons per acre.

Weather Forecasting and Observations. The success of and subsequent need for qualified meterologists on this type of project is doubtful. Forecasting was accurate only about 10 percent of the time, and unless an obvious large frontal system with rain moved in, it was always necessary to move to the blc and see what the actual on-site conditions were. Possibly the fact that the unit meterologist was compiling his forecast from Lewiston instead of making on-the-site observations made his forecasts less reliable than they could have been. Project weather observers did a good job, and about the only problems incurred were in picking locations within the block that were the most representative of block weather conditions.

Recommendations and Critique

1. Project Air Officer should provide intensive training on procedures involved in preparing lead calculation sheets.

2. Load calculation sheets should not be used for spray ships. FAA limits should be adequate as the FS procedure sorely affects operability.

3. Insecticide accountability and storage should be one of the duties of the Unit Safety Officer mainly because of the time factor and inconvenience to the Spray Operations Assistant.

4. Regarding contracting, all spray ships should be inspected prior to contract award.

5. Heliport locations should be initially established by someone who is intimately familiar with spray opeations. Heliports should then be designated as to the size of ship that can be accommodated. This should all be done prior to advertising the contract.

6. The pilot experience requirements should be amended to require at least 50 hours spray time in typical terrain. There is too big a difference between just flying and spraying in typical terrain.

7. Observation ships should be required to have some type of electrical fueling system which will enable them to fuel as fast as the spray ships.

8. A "maps and record" officer type should be assigned to handle all map preparation and initial procurement of photos and maps, and to maintain unit records such as daily progress reports, etc.

9. Provide heliport managers with radio equipped hardhats. This would increase mobility and probably improve efficiency and safety.

10. A system should be developed to allow insecticide storage tanks and tankers to be tested for leaks prior to filling.

11. A Regional list of specialized equipment should be maintained showing locations of items such as the Gifford Pinchot rotary snow plow, etc. that might be available on a specific project such as the DFTM Control Project.

III. SAFETY

Safety Approach

The Pomeroy Unit approach to safety was basically "low-key" in that although we were involved in an extremely hazardous project, the only way accidents were going to be prevented was for each person to assume personal responsibility for safe operations. This point was continually stressed and apparently successful based on the relatively minor accidents that did occur.

The Unit Safety Officer developed an addendum to the Project Safety Plan and prepared both aerial and ground hazard maps in a continuing effort to identify safety problems and potentially dangerous conditions. Informal sessions were held with all project personnel on an intermittent basis to discuss problems, both safety and otherwise.

Work Conditions

In the estimation of all involved, when considering the conditions under which the unit was operating, it was a wonder that more accidents did not occur than did.

Topography. With some minor exceptions, most of the terrain was exceptionally steep averaging from 40 to 100 percent sideslope. This generated many problems from spray patterns to foot travel. Local winds generated by these conditions made all flying hazardous and early in the project all buffer strip marking, etc. was restricted to early morning hours. Another potential problem was ferrying in crews to read plots, lay out spray cards, and insuring the pilots used proper heliports. A unit rule was than no "one-way" heliports would be used except in a life and death situation.

Roads. Except for the Idaho blocks, roads were few and far between, and then not particularly good. As mentioned previously, about 40 miles of road were plowed and because of snow conditions most were wet and muddy until after spray operations had started. This hazard was continually pointed out, and it was interesting that most vehicle accidents occurred on dry, low standard roads, instead of those that were wet.

Work Hours. Even prior to the commencement of spray operations, most of the personnel were required to work seven days a week. There was some time off after heliports were located, maps prepared, etc., but no more than a few days. After spraying began, heliport personnel were leaving for the field around 0230 hours and returning around 1300 hours. One significant problem was in getting work organized and personnel off-duty to get needed rest. The inherent hazards in this arrangement were also continually pointed out and no accidents occurred that were attributed to this cause.

Accidents

The only major accident that occurred was the spray helicopter that crashed on June 23. Fortunately the results were not near as bad as they might have been as the pilot sustained only minor injuries.

4 vehicle accidents occurred, and most were either attributed to either driver inexperience or carelessness. Based on the conditions and personnel involved, this was considered a fairly reasonable cost of doing business. While the record could have been better, it was fortunate that no personnel were injured other than one cut lip not requiring medical treatment.

Recommendations and Critique

1. A system of accountability for days and/or hours worked should be developed and maintained for all personnel, and compared to previously established maximum allowed sustained periods to prevent undue fatigue.

2. All personnel should have a valid first aid card prior to coming on the project if possible.

3. New employees (temporary) with no helicopter experience or actual experience driving on normal forest type roads should not be hired if at all possible.

4. More "teeth" should be made available to "ground" both observation and administrative helicopters and/or pilots if there is reasonable doubt as to their performance or ability.

5. Safety officer should have more assigned duties such as fleet and property management, insecticide accountability, etc.

6. A dispatcher who has the ability to handle crisis situations should be assigned to monitor radio traffic during periods of peak activity.

IV. ENVIRONMENTAL MONITORING

Coordination

One of the most significant problems involved was in getting initial response from other participating agencies. There appeared to be an undercurrent of "politics" involved and an apparent reluctance on the part of the Washington State agencies to get involved in the monitoring program and meet their committments.

Communication within these agencies was also a problem particularly in respect to available financing, and delegating direct responsibilities. Unfortunately, it was most difficult to try and identify where the real problem lay.

Toward the middle of the project, the situation improved considerably, due primarily to the efforts of the unit coordinator.

Environmental Protection Agency

The unit coordinator worked closely with the Unit EPA representative and at no time during the project were there any real problems in this area. The EPA representative attended all staff meetings and was kept informed of all problems and decisions as they occurred. He also was usually out on the project area when spraying operations were in progress.

The only significant disagreement from EPA arose from a slight departure from observation of spraying operations. As it turned out, this was mainly a problem of project plan interpretation.

Stream Protection

Streams were classified and only Class I streams (State criteria) were to be buffered. A number of personnel on the unit were concerned and the decision was made to buffer other streams that were running water, only not to the same extent as adjacent to the Class I streams.

Even with this additional buffering, insecticide residue did get into George Creek on at least one occasion, and resulted in a heavy kill of aquatic insects and organisms.

Insecticide Spills

The onyl significant spill that occurred was a result of the helicopter crash and was at least one quarter of a mile from any open water. The only real problem identified was not getting the monitoring coordinator to the crash site sooner. Once he did arrive at the site, the insecticide was properly taken care of as outlined in the continguency plan.

One potential problem that did not develop, was that the granulated charcoal to be used for mopping up water spills would not float when tested. If a spill had occurred in open water, we would have "been up that same creek without a paddle."

Recommendations and Critique

1. At the beginning of the project, the unit supervisor should insure that all personnel are aware of the duties and responsibilities of the environmental monitoring coordinator and his place in the organization.

2. Other production duties should be assigned the monitoring coordinator to make the job more rounded and challenging.

3. All open or running water should be buffered irregardless of classification.

4. Techniques for taking care of insecticide spills should be thoroughly field tested prior to the beginning of spray operations.

V. INFORMATION AND EDUCATION

Public Response

Public action and reaction was quite active in the Lewiston-Clarkston area in 1972 and 73. However, by the time the actual project began in 1974 most of the public furer had quieted down with the exception of the private landowners near Anatone Butte where the insect impact had been heavy.

An open meeting was held in conjunction with the State of Idaho in Lewiston, and response was only mediocre. Most of those who attended were landowners who had a real personal interest in the project.

There also were no incidents of environmental groups showing any interest in the control project to our knowledge.

Accomplishment and Procedures

The unit I & E Coordinator did an excellent job and was very agressive in making contacts and informing the public. His approach undoubtedly alleviated many potential problems.

Early contacts were made with the local newspapers, radio stations, and television stations, and a working relationship maintained for the duration of the project. An I&E display, including a progress map, was placed in one of the public activity offices in Clarkston prior to the start of spray operations.

Contacts were made with the local Chamber of Commerce organizations and both the I&E coordinator and unit supervisor attended at least three meetings. The coordinator also attended some SWCD and other cattlemen's association field trips, which helped inform these groups of the nature of the control project.

Overall, the I&E program was quite successful and had there been more public reaction there is little doubt that it would have been handled equally well.

Recommendations and Critique

1. More attention should be given to providing maps and aerial photos of better quality for both I & E and project use. Also more copies should be made available.

2. Office space needs to be provided to allow the I & E coordinator uninterrupted conversation with public contacts. In the case of the Pomeroy Unit, one extra trailer was needed for the use of pilots, contractors, and spray operations.

3. The daily situation report should not be submitted until the current day's production is known.

4. Not specifically I & E, but briefings should be held earlier in the day to permit crews to get the rest they need. This would also reduce cost to some extent.

VI. ADMINISTRATIVE OPERATIONS

Personnel Selection

In selecting key personnel for the project there were not many problems involved as many were handpicked by the unit supervisor and spray operations officer. The only real problem was in getting early confirmation of those who had been selected. This appeared to result from some deficiencies in Regional priorities and commitment to the project.

The real problem was in the temporary personnel assigned to the project. As most were new to the Forest Service, everything from conduct to payrolling procedures had to be continually stressed and explained.

Space Management

As mentioned previously, more space was needed. This was hard to predict initially but after a few weeks into the project there was a real need for an extra trailer for the use of the spray operations personnel including pilots and contractors.

Finance and Procurement

The Administrative Assistant had a two thousand dollar imprest cash authority which was adequate for the job involved. The most significant problem was in paying local obligations (motels, security, sanitation service, etc.) and many of these bills had not been paid at the time the project was terminated.

A better job of pre-ordering equipment and supplies could have been done, probably at a substantial savings to the government. As many items that were requested did not arrive on time, they had to be purchased locally at a higher cost than was necessary.

T&A's and Travel

Initially, there were few problems with time and attendance reports until the T&A clerk was transferred and left the project. Her replacement was not qualified for the position and some problems did occur later in the project.

Travel advances were continually a problem, particularly for the temporary employees. Very few came to the project with enough money to subsist for any significant period of time which subsequently required heavy outlays of imprest cash for advances.

Equipment

Some equipment problems have been mentioned previously. However, one additional item is worth mentioning and involves radio communications. Particularly during the normal working day (8 to 5) traffic from other stations continually interrupted project traffic. This was a problem that could have been resolved by using one of the available fire frequencies.

Recommendations and Critique

1. In selecting personnel for the project, a personnel officer type should be assigned full time to handle this task. As it was, the individual assigned to this project had other responsibilities that appeared to interefer with the selection process including follow-up.

2. An attempt should be made to provide back-up personnel to permit regularly assigned people to go home at least once during the project. This would help both morale and personnel effectiveness.

3. Once a person is assigned in a key position (such as a T&A clerk) they should remain on project until it is completed.

4. One of the personnel assigned to the project should be a qualified licensing examiner to test and issue Government driver's licenses.

5. The unit supervisor and principal staff should engage in an intensive team building exercise prior to the start of the project designed to provide mutual understanding and helpfulness, foster candor, and result in a more efficient decision making atmosphere.

VII. CONCLUSION

While not intended to cover all of the problems involved in the project, this report does highlight some of those which were considered most significant. Hopefully, if any of the personnel assigned to a similar future project, it will provide a guide to minimizing those kinds of problems and make the unit operate more effectively.

FINAL AS OF 7-20-74
DOUGLAS-FIR TUSSOCK MOTH PROJECT PROGRESS REPORT

UNIT POMEROY

Spray Block	Elev.	Acres	Coll. Pts. Est.	Mort. Plots Est.	Block Released	Spray Cards Laid Out	Spraying Began	Spraying Finished	Gallons Applied	Spray Cards Picked Up	Mortality %
1a A	4250	2474	2	4	6-19-74	6-21-74	6-22-74	6-22-74	2275	6-22-74	97.6
1b B	3250	2040	5	5	6-17-74	6-19-74	6-20-74	6-21-74	1943	6-21-74	100
2a C	3800	935	1	1	6-17-74	6-19-74	6-20-74	6-20-74	935	6-21-74	100
2b D	4400	2933	4	7	6-20-74	6-21-74	6-23-74	6-24-74	2759	6-24-74	100
3a E	5000	270			7-03-74						
3b F	4800	1050			7-03-74						
3c G	3600	494			7-03-74						
4a H	4400	649			7-03-74						
4b I	5000	1332			7-03-74						
4c J	4200	821			7-03-74						
5a K	5000	2580		5	6-28-74						
5b L	3800	3534		2	6-28-74						
6 M	4750	2814		3	6-28-74						
N											

DOUGLAS-FIR TUSSOCK MOTH PROJECT PROGRESS REPORT

UNIT POMEROY

Spray Block		Elev.	Acres	Coll. Pts. Est.	Mort. Plots Est.	Block Re-leased	Spray Cards Laid Out	Spraying		Gallons Applied	Spray Cards Picked Up	Mortality %
								Began	Finished			
7a	A	4500	2474	3	10	6-22-74	6-27-74	6-30-74	7-02-74	2258	7-03-74	97.8
7b	B	4500	3290	3	5	6-22-74	6-27-74	6-25-74	6-30-74	3168	6-29-74	97.8
7c	C	4250	3028	3	4	6-21-74	6-23-74	6-25-74	7-02-74	3098	6-29-74	97.8
8a	D	4550	2134		5	7-03-74						
8b	E	4900	2283	1	4	7-03-74						
9a	F	4200	1108	5	4	7-03-74						
9b	G	4500	1010	1	2	7-03-74						
10a	H	4800	2124		2	6-27-74						
10b	I	4400	1963	4	3	6-27-74						
10c	J	5000	1355	1	4	6-27-74						
10d	K	4900	2529	1	3	6-27-74						
11a	L	4000	3501	3	4	6-27-74						
11b	M	4000	1934		1	6-27-74						
	N											

DOUGLAS-FIR TUSSOCK MOTH PROJECT PROGRESS REPORT

UNIT POMEROY

Spray Block	Elev.	Acres	Coll. Pts. Est.	Mort. Plots Est.	Block Released	Spray Cards Laid Out	Spraying		Gallons Applied	Spray Cards Picked Up	Mortality %
							Began	Finished			
2a A	4800	1171		2	7-03-74						
2b B	5000	1756		3	7-03-74						
2c C	5000	1584		3	7-03-74						
D											
E											
F											
G											
H											
I											
J											
K											
L											
M											
N											
Total:		*55,170							** 16,436		

* Dot count acres corrected for openings, buffer strips and non-host type.

** Gallons actually applied rounded to nearest gallon.

Unit Spray Operations Officer

The spray operations officer is responsible to the unit supervisor for the efficient functioning of the spraying operation as assigned. His major responsiblility is to assist the unit supervisor in securing an effective and well-coordinated spraying operation. The principal duties are:

1. With the assistance of the project air officer and the concurrence of the contractor, local heliports and facilities for the safe and efficient use of helicopters.

2. In charge of all spray operations including observation. Duties under this pahse include:

   a. Provide instruction and training to project personnel on individual work responsibilities of the aerial operation.

   b. Explain objectives and plan of action, aerial and ground hazards, and review safety plan.

   c. Develop good cooperation and understanding between contractor and project personnel.

   d. Make certain that spray pilots are properly briefed by contractor's representative on block boundaries, flight patterns, critical fish streams, nonspray areas, etc., before starting to spray.

   e. With the assistance of the contractor, project air officers and aerial observers, direct and inspect the application of insecticide by each pilot.

   f. (Insure aerial observers and heliport managers observe each pilot's flying practices, including attitude), airspeed and flight pattern, (and frequently personally checks these practices). Works thry contractor's representative to correct poor or unsafe practices.

   g. Insure that all unsafe practices and equipment (germane to air operations and activities for which he is responsible) are corrected immediately.

h. At the end of each day, see that all pilots are briefed on sufficient areas to carry them through the next day without having to break into the spray period.

i. Maintain continuous contact with the aerial observers, weather stations, and heliport managers concerning safe flying and effectiveness of spray application. The decision to shut down spraying is based on many factors and may vary from one spray block to another. When weather conditions become critical (wind above six miles per hour and/or temperatures exceed 70 F) or spray materials are not settling into trees, a final decision will be made by the spray operations officer to shut down the operation for the day at each spray unit and relayed to the contractor through the heliport manager.

j. Enforces FAA and 1/ Forest Safety regulations relative to aircraft.

k. Is thoroughly familiar with applicable regulations in FSM 5700 covering air operations.

l. Fly with observers to familiarize them with all key landmarks.

m. Maintain all communications with the assistance of the communications officer.

Unit Safety Officer

The unit safety officer is directly responsible to the unit supervisor for all safety activities on his assigned unit. (He also serves as unit property custodian and maintains accountability for insecticide). His principal duties are:

1. In conjunction with the project safety officer, supervise all safety activities on his assigned unit.

2. Make preliminary accident investigations and notify project safety officer and unit supervisor of factors involved.

3. In conjunction with the unit administrative assistant, provide adequate supplies of all necessary accident forms.

4. Supervise the execution of the project safety plan on his assigned unit.

5. Develop unit supplement to project safety plan.

6. Provide security for insecticide storage and other project materials and supplies through local law enforcement officers at all locations.

7. (Insure insecticide inventory at project headquarters is maintained at a level consistent with the needs of the spray application activity. Acts as inspector on the insecticide contract and maintains the appropriate records required for accountability).

8. (Establishes and maintains a system of property accountability and inventory, and insures that a strict accounting is made on all sensitive property items).

9. (When needed, assists the spray operations officer dispatching observation and administrative aircraft during non-spray periods. Keeps a continuing record of aircraft and pilot times).

Unit I & E Coordinator

The I & E Coordinator (Public Information Officer) is responsible to the unit supervisor for disseminating factual information about the project and its progress. His primary objective is to facilitate the gathering and release of accurate news story material. His principal duties are:

1. Set up an information center to which all requests for news and information about the project can be channeled.

2. Notify local news media of the numbers to be called and hours the service will be provided. Contact city editors of newspapers or news directors of radio and TV stations. Learn their deadlines.

3. Keep project headquarters, news media, cooperating agencies and local administrative units advised of project progress.

4. Maintain a project progress map at information center and at selected locations in community.

5. Prepare fact sheets, press kits and display material as needed.

6. Meet with local community groups such as Chamber of Commerce, timber industry, farmers' organizations, etc. to discuss project objectives and anticipated results.

7. Arrange to personally conduct reporters and photographers when on-project coverage is desired.

8. Be prepared to handle tape recorded interviews by telephone or in person on request from radio and TV.

9. Become knowledgeable about monitoring plans and research being carried on.

10. In case of loss of life or a serious accident or injury withhold information regarding personnel pending notification of next of kin.

11. Assist spray operations officer in maintaining a record of accomplishment through use of aerial photographs, mosaics, and topographic or planimetric maps.

Spray Deposit Checkers

Spray deposit checkers will be responsible to the unit spray operations officer for the spray deposition program. Their principal duties are as follows:

1. Serially number and distribute spray deposit cards before spraying, (indicate locations on aerial photos or topographic maps), and collect (and summarize) them after spraying.

2. Deliver the spray cards to the (unit spray operations officer) the same day as collected, (and include a written summary of results indicating possible problem areas, skips, overlaps, etc.)

3. Observe the performance of spray aircraft whenever possible.

4. Keep informed on areas in which spray deposit cards are to be distributed each day.

5. Accurately and legibly fill out all necessary forms for spray deposit information.

Aerial Observers

The aerial observers are responsible to the spray operations officer for information on all activities of spray application. The principal duties are:

1. Know the project unit boundaries:

   a. Know the block boundaries
   b. Know the local landmarks
   c. Know the communication blind spots

2. During spraying, checks to see that helicopters stay within block boundaries. (Brief pilots on each days operation including boundaries and flight patterns). Check on proper swath overlap, shutoff at end of spray runs and whn crossing excluded areas. The time to spray out a load should be checked daily for each spray helicopter by use of a stop watch. Watch for leaky spray valves and nozzles and report them immediately.

3. Checks on the spray swath for proper settling into the timber. Watch for drift and spray breakup due to air turbulence. Observe and report on local weather conditions. Recommend to the spray operations officer shut down when the spray drifts, rises, or starts to break up.

4. Check on all aircraft for safe flying practices and for observance of flight patterns to and from the block.

5. Assist pilots and spray operations officer in posting daily spray coverage on the progress map.

6. Maintain an accurate flight log.

7. Make written reports on unsafe flying practices observed and on accidents or incidents pertinent to operations.

8. Know the search and rescue plan and be prepared to act immediately. Know helicopter landing spots for all blocks.

Assistant Entomologist

The assistant entomologist will be (the professional assistant to the unit entomologist and) will be charge of the technical staff during (his absence). Duties (will include):

1. Become thoroughly familiar with each control unit - maps, mosaics, roads, boundaries, elevations, blocks, egg larval collection points, and larval mortality points.

2. (Supervise biological aids in making) twice-weekly egg observations to determine hatching period.

3. Advise the unit entomologist as to rate of egg hatch on project.

4. Assist the unit entomologist in choosing larval mortality sampling points and preparing work schedule for all technical personnel and post this schedule one or more days in advance.

5. (Supervises biological aids in sampling) larval mortality, and laying out and collecting spray deposit cards when regular spray card checkers are (involved) with other duties.

6. Confirms all communications - radio messages, telephone conversations, verbal reports, etc., in writing.

7. (Trains biological aids in general biology of the insect, including sampling techniques and procedures for egg and larval surveys).

Heliport Managers

Each heliport from which aerial spraying will be conducted during an operating day will be manned by a heliport manager. His primary responsibility will be to monitor the entire operation at this assigned heliport. The principal duties are:

1. Supervise the loading of spray helicopters with insecticide and keep spray load records by helicopter and by block number (Form 25).

2. Check insecticide loads so as not to exceed (A/C load) limits.

3. Maintain close surveillance on minimum gasoline requirements for each helicopter during the operating period each day.

4. (Supervise the maintenance) of accurate records of time of takeoff and landing of all helicopters using the heliport (Form 25). When changing heliports, advise (the aerial observer and spray operations officer).

5. Report to the unit spray operations officer all (major) leaks and helicopters coming in with open dump valves. Helicopters with major or minor leaks or drooling nozzles (will) be grounded until corrections are made. Maintain a record of all conditions of this type.

6. Report immediately any helicopter that is overdue to the air operations officer and alert the monitoring helicopters.

7. Observe loading area practices and (immediately correct those practices that are unsafe or out of line with contract specifications. Document all action, and keep spray operations officer informed).

8. Observe landings and takeoffs for conformance with prescribed flight patterns and safety procedures.

9. Maintain constant radio standby during all periods of heliport operations. Record all significant messages received or sent.

10. Report to the air operations officer the volume of insecticide loaded each day per helicopter, and hours flown per pilot.

11. Be familiar with the search and rescue plans and be prepared to handle all emergency communications accordingly.

12. The heliport manager will shut down each helicopter upon request of the spray operations officer. However, if the spray operations officer is not available and circumstances warrant, he will shut down each helicopter.

13. The heliport manager will act as (application contract inspector (for helicopters and heliports).

Load Checkers

Load checkers are directly responsible to heliport managers. Their principal duties are as follows:

1. Maintains (accurate) spray load records for each spray helicopter, by (heliport) and block number.

2. Know allowable insecticide loads for each helicopter and be sure they are not exceeded.

3. Maintain records of fuel loaded in each helicopter and be sure that minimum fuel requirements are being maintained.

4. Maintain accurate records of time of takeoff and landing of all helicopters.

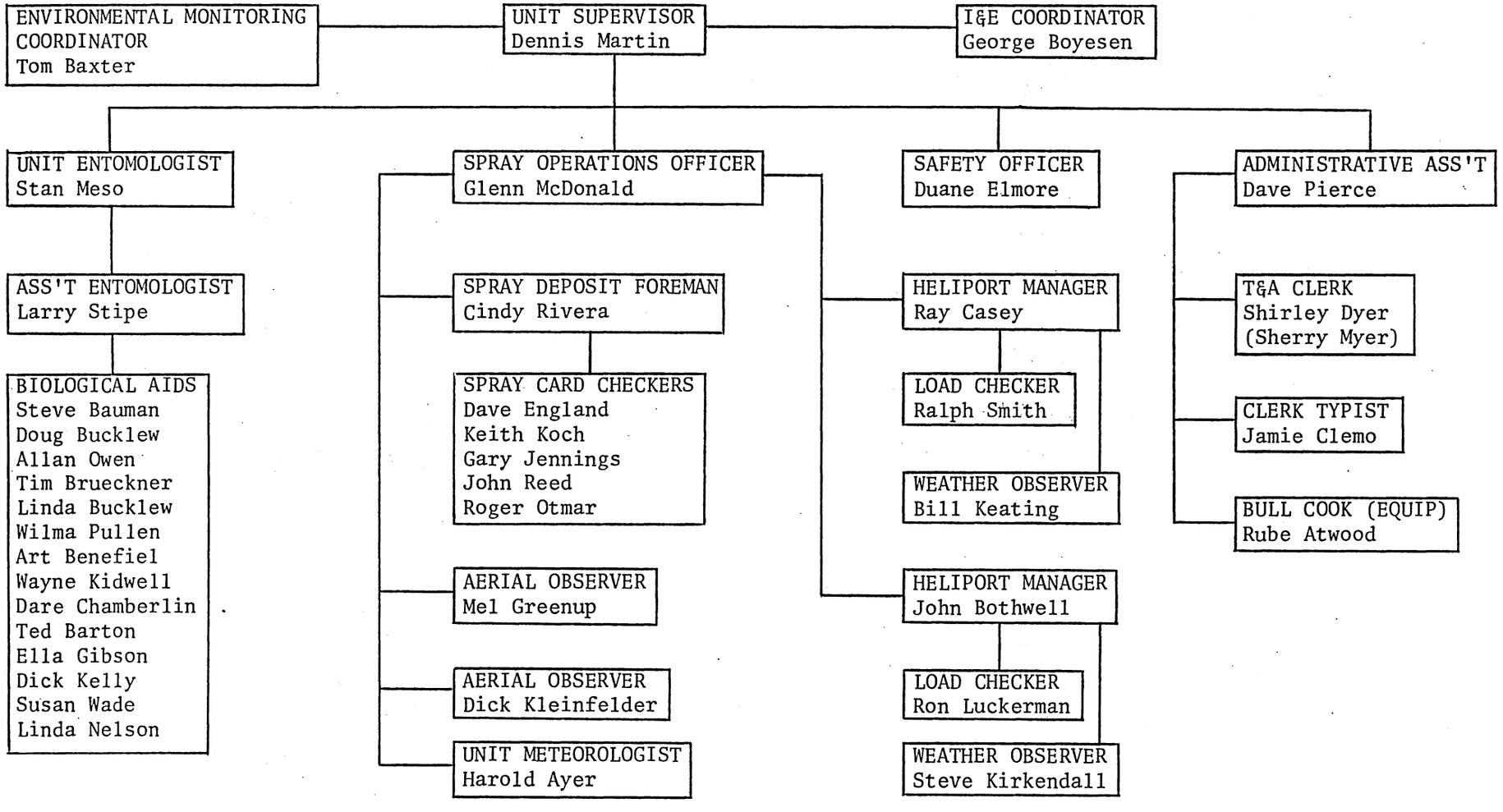
5. Report to the heliport manager all leaks in helicopter spray systems or helicopters coming in with open dump valves. Maintain a record of all conditions of this type.

6. Report immediately to the heliport manager, any helicopter that is overdue.

7. Be familiar with and closely follow all safety precautions for heliports, as listed in the project safety plan.

8. (Escort insecticide tankers when changing locations, using preplanned travel routes, and insure that all pertinent safety requirements are met).

POMEROY UNIT ORGANIZATION



CRITIQUE OF PROJECT

From the beginning it was obvious that most people were committed to the project. At first morale was very high. Other than lacking experience in their particular function, I personally think the project personnel operated rather smoothly. Considering the situation placing sommany people in posiEions needing close cooperation, I really marvel at the lack of conflict on this project. It was a great training experience for most. My biggest problems came from so many people not understanding the business management procedures. There is some doubt in my mind about the committment of the Umatilla and Wallowa-Whitman Supervisors Office personnel to this project. So far very few bills have been paid. Special menfion should be made commending Bill Carterffor the work he did in fleet managemenf and personnel. The last 2 weeks of the project were the most difficult because of so much slack time, but I have no suggestions on how to alleviate this sitsuation.

I have some suggestions for a future project of this type:

1. No personnel should be placed on the project unless they have prior F.S. experience. One of the greatest impacts on the bus. mgmt. section was arranging for travel advances for these people, as well as trying to inform them of payrolling and per diem procedures. It is difficult enough to train employees unfamiliar with their jobs, let alone totally unfamiliar with the Forest Service.

2. Tbere should be more space provided for the observers, heliport managers EPA representatives, and contractors to take of their daily business. The heavy traffic through the office was disrupting to all office personnel.

3. A radio system similar to a fire net should be set up. If we would have had a heavy spray operation, I am sure we would have had real problems with all the other radio traffic.

4. Abolish the weatherman position. The weather observers were much more valuable to us.

5. Provide for a qualified licensing examiner to test and issue licenses on the project for those personnel who require, but don't have, Government drivers' licenses.

6. No person should be transferred and/or allowed to leave the project. I felt Shirley's leaving affected her performance the week before she left and also had an adverse affect on the total Business Mgmt operation.

7. More effective use of the Environmental Monitoring Coordinator could be made. Greater analysis of the jobs should be made before the project begins, so duties could be assigned more accurately. Also, the Safety Officer could incorporate additional duties into his job. The fantastic way Duane Elmore picked up the load for other people points this out.

Dave Pierce

Administrative Assistant

June 27,1974

Dennis:

It is with some reluctance that I pull out of the project at this time. There is a fine group of dedicated people here,and it has been a pleasure to part of the outfit. The organization I feel has had the benefit of your organizational ability and supervision. You have instilled a good professional attitude for performance. I assure you that I am most sincere in this comment.

I trust I have been of some service to you. It is difficult for me to make any quantitive measure of accomplishment. Actually the pressures from the "public" has been far less than I had anticipated. My tour here has been a learning experience for me,and I appreciate your patience.

I have listed a few points that have occurred to me. None are intended to be critical but observations from where I sit. No priority.

Maps and Map Making

The quality of copied maps has been quite variable. Perhaps this stems from too many people trying to do the work but not really having the ability to trace or copy. Since the demand for working maps ishigh by both aerial and ground people assigning or hiring a person for that specific job would pay dividends in quality work. There appear to be the need for frequent map changes and not everyone has the ability to even make a quality tracing.

Record Keeping

In my judgment the Spray Operations Officer and Unit Supervisor are too bogged down in record keeping. This is not a criticism of these two people but the way the organization and responsibilities has been set up. Perhaps a maps and records officer similar to a project fire overhead team could accomplish these first two items listed.

Spray Block Numbers

Perhaps I never did get myself fully oriented,but the numbering of proposed spray blocks has been confusing. I don't fully understand why blocks can't be number designated without making subsequent changes.

Map Supply

I am sure it must be difficult to make an estimate of needs. But I believe there were some real shortages of specific maps. Perhaps some backup supply souree needs to be considered.

Quality of Photos and Ozliads

What I have seen appear to be poor quality for a project of this magnitude. Neither has been usful for aerial personnel - pilots or observers. I don't feel that the R.O. has provided the best of photo work available. Even if it took a special flight for each of the spray units it would be worth the price. Colored photos blown up to a workable scale would be desirable. The use of high level photography may have some practical application.

Spray Ship Safety

In my judgment four spray ships working in a single spray block is excessive and a major hazard to safety.

Radio Communication

Has been only fair at best. As the Ranger District starts manning for fire this problem increases. Many blind spots are one thing, but the competition for air time with the District seems unnecessary as long as exclusive nets are available at the fire cache. The distractions to pilots and other aerial people is a hazard to safety.

OFFICE FACILITIES

THE AVAILABILITY OF OFFICE SPACE IS UNDOUBTLY DIFFICULT. I HAVE TWO SUGGESTIONS:

1. AIR CONDITION WORKING SPACE FOR OTHERS AS WELL AS THE OVERHEAD.

2. SEPARATE READY ROOM FOR PILOTS AND CONTRACTORS. IT IS DIFFICULT TO DISCUSS OUR BUSINESS IN THE PRESENCE OF "OUTSIDERS". ALSO SOME TIMES DIFFICULT TO FIND A PLACE TO SIT AND WORK.

BRIEFING SCHEDULE

I BELIEVE BRIEFINGS WERE DELAYED UNTIL 1700 FOR PURPOSES OF GETTING THE MOST RECENT WEATHER REPORT. FOR THE PEOPLE WHO HAVE THEIR DAY IN BY 1430 THE BRIEFING AT 1700 CUTS IN ON THEIR REST PERIOD. THIS CAN CONTRIBUTE TO UNNECESSARY PEOPLE FATIGUE. SINCE THE WEATHER MEASUREMENTS AT THE HELIPORT ARE THE CONTROL FACTORS THE PROFESSIONAL WEATHER FORECAST DOESN'T DO THAT MUCH FOR THE OPERATION.

COMMENTS ON I & E.

CONCERNING THE DAILY SITUATION REPORT I SUGGEST THAT IT BE HELD LONG ENOUGH TO GET THE CURRENT DAY'S PRODUCTION.

IMPACT OF PEOPLE AND FAMILIES.

THE DURATION OF THE PROJECT LIKE THIS IS DEMANDING UPON THE PEOPLE, PEOPLE THEIR FAMILIES AND THE UNITS THEY LEAVE. SOME WAY OF PROVIDING BACKUP PEOPLE IN KEY POSITIONS WOULD BE DESIRABLE. NO EASY SOLUTION BUT SHOULD BE CONSIDERED.

CRITIQUE July 4, 1974

FOREST SERVICE TUSSOCK MOTH CONTROL PROJECT

Initial planning and analysis for the project appears inadequate. It is my understanding that the original boundaries of the units to be sprayed were put on a planimetric map. I believe that these boundaries should have been placed on $7\frac{1}{2}$ USGS Quadrangles, with contours, to the best of the entomologist's ability.

Selection and establishment of the original heliports was done by people with little or no knowledge of aerial spray operations. This resulted in unnecessary work on heliports that were not used. On ground recon could have helped this situation.

The basis for analysis and establishment of the spray block boundaries sounds good on paper. However, I believe that the sampling procedure was too extensive for accurate mapping of spray block boundaries. A system using lines as plots would have given much more accurate data for establishing boundaries of areas to be sprayed. A systematic grid or lines radiating from a central point are recommended as possibilities for future projects to pin down infestation location more accurately.

The photo - ozalids available for the project were almost unusable. The only thing I got off the ozalids were the unforested openings.

Vegetative type maps should have also been used to determine no - host species location within the proposed spray blocks.

From our first meeting at Walla Walla through the project, I had, and still have, the feeling our system of analysis was not sensitive enough. I believe that we may have sprayed areas that did not need spraying in Blocks 7a, b, and c. I also have the feeling, that I hope is wrong, that the analysis done to determine whether or not to spray may have been

biased in favor of spraying.

Inspection of aerial observation helicopters was inadequate and too late for smooth operations when reconnaissance began. Up to a week into the project, the radios in these ships were performing inadequately. I believe that inspection of these ships should have been done and all deficiencies corrected before beginning of operations.

Use of a fully qualified weatherman was an unfortunate waste of talent and manpower. Adequate weather information is always available from currently established weather services. We always check the current weather within the area to be sprayed to determine whether to spray at a given time.

Load calculation sheets were a continual problem throughout the project. Explaining the use of this form was left up to the aerial observers and heliport managers. I believe that the project air officer should have explained the use of this form to the pilots and that he should have furnished us current helicopter equipped weight prior to beginning the project. We were finding discrepancies up to two days before the last day of spraying (7/2/74).

Assignment of radio frequencies appears to not have been well thought out. We encountered interference from other units throughout the project. There was also some unnecessary discussion on the Forest Net radios which caused occasional difficulty during spraying operations.

The foregoing is presented as constructive criticism and is not intended to embarass anyone. I believe that the performance of such a variety of people with very different backgrounds was exceptional. We were able to perform the job well with a minimum of confusion. Everyone connected with the project had an above average attitude towards safety.

For future spraying projects the following is recommended.

At least one season before starting the spray project, someone intimately familiar with spraying operations should do advance aerial and ground reconnaissance. This should include selection of heliports, travel routes to and from heliports, condition and maintenance of travel routes, adequate photographic maps showing the selected heliports and travel routes and an information sheet for each heliport selected.

If this recommindation is adopeted, I would like to have an opportunity to volunteer for the job.

Mel Greenup

Mel Greenup - Aerial Observer
7/4/74

UNIT SAFETY OFFICER

As Unit Safety Officer, I found I had very little to do on this project. When, in a week after I was on the job, I had my Safety Plan completed. It took some time to get the gear for the crash kits on the project. I feel that other duties could be a part of the Safety Officer's job. Fleet Management, and Communications could well fit into this position

As Safety Officer, I feel that I should have spent more time in the air or at the heliports during the spray operations. There were other people using aircraft that may or may not have needed to be there. On feed-back from the Heliport Managers and observers, I found out some problems did exist that were never resolved.

Smoking by Spray Pilots and their crew on the heliports should have been resolved. Also, the observers felt there was a problem with too much radio use during spray operations. Fire net system with unit controls could have solved most of the radio problems.

Use of new hires around helicopters as load checkers was leaving us open for a major accident. People should be familiar with helicopters before being sent to this type project.

The two ships that were used for observer ships should have had a more complete inspection before going on the job. We had some major radio problems with them. Maybe a pre-contract inspection before they could be considered.

We had some problems with two of the spray ship pilots as to how they operated their aircraft. I do not feel we should be concerned except only if it endangers other people or Forest Service personnel. In the case of this project, a pre-work meeting with the pilots may have helped.

The ship that crashed, I feel, was due in part, to lack of experience on behalf of the pilot. Reforestation's chief pilot should have spent more time with him. The ship was flying part of the time overloaded. We did not have the 5700-17 form that gives the empty weight of the ship. We relied on the pilot for this information and it was in error.

I do not feel that we should concern ourselves with overloads unless they are hauling Forest Service personnel. No more than we do with a logging truck or a timber scale.

Accountability of DDT became a problem at the end of the project. It appears that we should have recorded the temperature during pumping operations and corrected for expansion. This may have resolved part of the differences we had between our records.

New hires should have been given a driving test by a license examiner from the standpoint of job pressure; everyone on the project being unfamiliar with the roads, etc.

On the whole, I think everyone was quit safety conscious and performed very well. We had one driver that was a bit fast and a couple overly-cautious.

DUANE ELMORE
Safety Officer

CRITIQUE OF THE
DOUGLAS-FIR TUSSOCK MOTH SPRAY PROJECT
POMEROY UNIT

The position of Environmental Monitoring Coordinator on this project was a job uniquely different from any that I have ever experienced.

It was a position that was hard to relate to people as to the need for and duties of the Coordinator in most conversations. As time passed, it did become much more apparent that there was a need for this position on such a project.

The position from the start, was labeled as a non-productive-type job. One in which was not needed to get the spraying done. I feel this could be broadened to include other jobs which would be looked upon as trying to assist in getting the job done rather than as a hindrance to accomplishment.

I felt that there was an imbalance in job descriptions and that it could have been partially relieved by assigning other jobs to the Monitoring Coordinator. For example, I feel that the Spray Operations Officer had more than he could realistically accomplish in such a short time span. Some of those jobs could have been reassigned to the Environmental Coordinator to offer some relief to the Spray Operations Officer and, at the same time, offer more enrichment to the Coordinator position. This was something that I tried to do late in the project, not only to assist the Spray Operations Officer, but also to establish the fact that the Coordinator's job could and should be a part of the production-oriented portion of the organization.

During the operation, I worked very closely with the EPA representative, Ken Brooks, and I feel that that rapport was necessary to do a quality monitoring job.

Some of the early problems that I had were to find that many of the collectors from the States of Idaho and Washington had little or no notice of their participation in the monitoring program. This created problems as many of them were not committed to the program or did not have the money nor manpower to do their regular job and the sample collections at the same time. That was the biggest problem that I had on the Pomeroy Unit. I feel that it may have been different if there would have been more participation by the various state agencies who were likely to be involved. I say this not knowing how it was persued from the start.

One thing that was confusing to me was the facet of the project whereby only certain streams were buffered and protected from spraying. In an ordinary herbicide program on a district, the constraints under which one operates are much more restrictive than they have been on this project. I do feel that all of the people on this unit were very receptive and willing to buffer any live water areas regardless of the classification.

To conclude, I feel that this project went very well. It was a fascinating group of people that were put together and the teamwork that seemed to develop throughout was tremendous. I feel that on any other project of this nature, that the families which have been left behind should be more closely considered. Especially for those people who were a considerable distance from home and never had an opportunity to make it back.

In my case, I felt that the supervision over my position was adequate.

Many of my comments made above have also been written in my daily diary which also is a part of my report.

TOM BAXTER
Environmental Coordinator

PROBLEMS TO CORRECT NEXT TIME

1. Some inspection of aircraft was inadequate. This mainly involved radio and intercom systems. It appears that several ships, namely the Aero Service ships, were inspected and approved with these systems out of order. These systems continued to give trouble for some time.

2. We had problems obtaining the empty weights on helicopters. There was alot of conflicting information.

3. Better training was needed on use of the load calculation sheets.

4. I feel that the Forest Service was out of line on our load limits for spray ships. These ships do not carry any of our personnel. Therefore, I think that they should be permitted to carry weight at least up to the limit permitted by the FAA.

5. Pilot experience for spray pilots working in this type of rough terrain should include at least 50-100 hours of timber spraying in the mountains.

6. Fuel service for observation ships should be better. Frequently, our people had to pump gas which should not be done. They should always have their service man available to do this. A faster pump should probably be required. The spray ships had electric pumps. The hand pumps of the observation ships could not keep up with the spray ships and this caused a loss of time.

7. Unit boundaries were not specific enough for a long time. I don't know if anything can be done about this, but it sure caused problems in our preparation work.

8. Throwing of streamers was found to be a tricky operation. Hangups on the skid are quite dangerous, as hangup could come off and hit the tail rotor. Streamers should be thrown wrapped up in such a way that they will unwrap on the way down. They should be thrown out and away from the ship. This work should be done only by people experienced in working with helicopters.

RICHARD A. KLEINFELDER
Aerial Observer
Pomeroy Unit

TUSSOCK MOTH PROJECT OBSERVATIONS
POMEROY UNIT

This is a general account of the project from my standpoint as an aerial observer. I have also kept a detailed daily diary which outlines the specific jobs I did on a given day.

I arrived on May 27, 1974. The first job I had was setting up the Clarkston base heliport. Then from May 29 to June 19, I went through a period of preparation and orientation for the aerial observation work. This included considerable air reconnaissance of the spray block terrain and boundaries, and reconnaissance for potential heliports. Buffer areas were reconned and in a number of cases, markers were hung to mark these buffers. Several methods were tried including streamers made of orange plastic, string, and weights, streamers made of crepe paper and wire (smokejumper drift streamers) and toilet paper. All were successful except the toilet paper will not last through any wet weather. The plastic streamers will probably last for years. The smoke-jumper streamers will not last as long but did not hang up as well. Also during this period, considerable time was spent making up maps and photo ozalids and making streamers. Some frustration was experienced due to the fact that boundaries were not final. This made it difficult to produce proper maps and photos.

Several things of note occurred during this period. On June 4-5 the weather deteriorated so that it was not possible to fly. Snow occurred at the higher elevations and the weather was quite cold everywhere. On June 8, we had a dry run for spraying on block 7b. On June 11, the J2 helicopter had a breakdown involving a broken control bracket. This was fixed by June 14. On the same day, a transmission problem occurred. The transmission was re-placed and the ship was back in service on June 18. On June 12, I received training on administering bee sting shots. On June 16 I assisted in the calibration of the spray ships.

We finally started spraying on June 20. We had reconned the units earlier with the spray pilots. This practice was con-tinued on each unit. I worked 2a while Mel worked 1b. We had the smaller unit and finished first. We moved over to 1b and worked the west end. We didn't finish because of rain. On June 21 we finished this unit with a short day.

On June 22, we all sprayed on block 1a. I did the north side and Mel did the south side. Completed the block with very little time to spare.

On June 23 we started to spray on block 2b. I had the east half, Mel the west half. Ron White had a breakdown (blown stack) that put him down for the rest of the day. Mike Bucove crashed his ship into the trees in rough terrain. The ship was destroyed but Bucove escaped unhurt (see my account in accident report). Spraying was halted for the day. On June 24 the block was completed using three ships.

From June 25 to July 2, we worked on the seven units. I worked 7c with one ship (White) and Mel worked 7a and 7b with two ships. During this period, we had a number of bad weather days, mainly due to excessive wind. June 25 was good. June 26-28 were windy with little or no spraying done. June 29-30 we sprayed in marginal conditions with fair results. July 1 was too windy. July 2 was a good day and the units were completed. White assisted on 7a towards the end.

About June 30 we started to receive word on the possible population breakdown. By July 2, it appeared that spray operations were probably complete. We then entered a period of watching for visible damage.

RICHARD A. KLEINFELDER
Aerial Observer
Pomeroy Unit

EVALUATION OF PROJECT

For the most part I feel that the project went fairly well, however, a few of the problems that did come up are as follows:

1. Lack of experience of the people selected for load checker positions. I feel that this was a downfall on the part of the people who selected these individuals. One had never worked for the Forest Service before and neither had experience on heliports. Obvious solution here is to use a different set of rules next time.
2. Moving news media and other tourists to and from spray areas by helicopter. As long as they stayed in the air fine, but when landed they gratly increased the load on the heliport manager. I realize that htis is part of his job, but when too many irons are in the fire, the efficiency of the heliport decreases.
3. Failure of Air Operations, Walla Walla, to pass along pertinent information made it difficult to check the accuracy of load calculation sheets. It would help greatly if a copy of the 5700-4 for all aircraft involved in the unit project be in the hands of the Spray Operation Officer prior to the beginning of spraying.

Signed:

Raymond F. Casey — Heliport Manager

John P. Bothwell — Heliport Manager

CRITIQUE OF POMEROY SPRAY UNIT

I have several comments that will be pertinent to the next spray project that we undertake.

1. A pre-award inspection of all aircraft to be used should be made. If it is not feasible to make a pre-award inspection, then a realistic deadline for preparation should be set. This deadline should precede the anticipated starting time sufficiently to insure that the ships will be ready at starting time.

2. The aircraft service contracts for the observation ships should specify a fueling system capable of filling the ship in a realistic time, say, 10 to 15 minutes. Some problems were encountered with slow fueling procedures on observation ships.

3. The safety aspects of helicopter use could be improved by providing "No Mex" coveralls for those persons who are continually exposed to the possibility of aircraft crash and subsequent fire.

4. It should be possible and expedient to put safety maps and records as well as other related jobs under one person. In addition, one person should be assigned the duties of maintaining a photographic and written record of the project.

5. The versatility and efficiency of the heliport managers could be markedly improved by providing them with a radio-equipped hard hat. This would eliminate the problem of the heliport managers being tied to the radio. And, in addition, radio-equipped hard hats would be invaluable where sling loading was being done.

6. All of us who were involved in this project should now realize the importance of research oriented toward the accurate forecasting of both population, epidemic, and collapse.

7. It is difficult for me to understand the reasoning behind our procedure of placing load limitations above FAA limits upon our contract spray ships. We do not specify the number of logs a skidding cat can drag per turn, so why should we limit spray ships beyond what the FAA says is safe?

8. The system of insecticide accountability we used seemed to be very satisfactory.

9. It would be very desirable for us to devise a system of testing storage tanks and tankers for leaks before filling them with insecticide. It seems feasible to me that we could specify an air pressure test to 30 lbs. before approving tanks for use.

10. When another spray project of this magnitude is anticipated, one of the first things that should be done is to build a high-quality base map with vegetation type and recent roads located on it. One of the most significant problems we encountered would have been reduced by the use of such a base map.

GLENN McDONALD
Operations Officer

STANDARD FORM 2-B
FEBRUARY 1965 EDITION
GENERAL SERVICES ADMINISTRATION
FPR (41 CFR) 1-16.601

U.S. Government Lease for Real Property (Short Form)

LEASE
DATE
NO. P-1

The LESSOR leases to the UNITED STATES OF AMERICA, hereinafter called the GOVERNMENT, the described premises on the terms stated herein, including the conditions on the reverse hereof.

1. LOCATION OF LEASED PREMISES Located west of road in the SE¼ of the NW¼, Section 10, T.6N., R.42E., in Garfield County Washington

2. DESCRIPTION OF LEASED PREMISES Parcel of land 200 feet by 200 feet, including access. No permanent improvements will be made. Parcel will be used for a heliport for contract helicopters involved in the 1974 tussock moth spray project.

3. TERM. To have and to hold:
For the term beginning June 5, 1974 through July 31, 1974
From year to year thereafter, but not beyond July 31, 1974 this lease may be renewed by the Government by giving at least 30 days' notice in writing to the lessor before the lease would otherwise expire, said notice to be computed commencing with the day after the date of mailing.

4. TERMINATION. The Government may terminate this lease at any time by giving at least 15 days' written notice to the Lessor. Said notice shall be computed commencing with the day after the date of mailing.

5. RENTAL. The Government shall pay the Lessor ~~annual~~ rent of $ 75.00 at the rate of $ 75.00 per lump sum, in arrears. Rent for a lesser period shall be prorated. Rent checks shall be made payable to:
Benny L. O'Keefe
2716 Country Club Drive
Lewiston, Idaho 83501

6. SERVICES AND UTILITIES (*Enter "X" in box for each item to be provided by Lessor as part of lease*)

- ☐ (1) HEAT
- ☐ (2) ELECTRICITY
- ☐ (3) POWER (*Special equipment*)
- ☐ (4) WATER (*Hot and cold*)
- ☐ (5) CHILLED DRINKING WATER
- ☐ (6) AIR CONDITIONING
- ☐ (7) ELEVATOR SERVICE
- ☐ (8) WINDOW WASHING (*Quarterly*)
- ☐ (9) TOILET SUPPLIES
- ☐ (10) JANITOR SERVICE AND SUPPLIES ..... (*Frequency*)
- ☐ (11) INITIAL LAMPS, TUBES, BALLASTS AND REPLACEMENTS
- ☐ (12) MECHANICAL VENTILATION
- ☐ (13) OTHER (*Specify*)

7. SPECIAL OR OTHER PROVISION(S) AGREED UPON Lessor shall permit the Forest Service to construct a temporary fence and to post warning signs around and adjacent to the leased area. The Forest Service will remove said fence and signs by the end of the designated lease period. The Forest Service will also remove any debris or other material resulting from their operations.

LESSOR
Benny L. O'Keefe
2716 Country Club Drive
Lewiston, Idaho 83501

BY Benny L. O'Keefe (Signature) ..... (Signature)

UNITED STATES OF AMERICA

BY ..... (Signature) Contracting Officer (Official title)

2-301

(See General Provisions on reverse)

PROPERTY INVENTORY

Item	Quantity
personal first aid kits	22
polyethelene bags	2 boxes
chain saws	2
toilet paper	3 boxes
chain saw chaps	2
paper clips	107 boxes
portable sink	1
rubber hoses	2
100 foot tape measure	2
goggles	8
tote bags	2
batteries	552
wash pans	3
weather balloons	1
tree marking paint (orange)	61 cans
canteens	7 cans
tree marking paint (yellow)	8 cans
tree marking paint (silver)	12 cans
booster cables	1 pair
industrial face shields	4
5 gallon plastic jugs	4
metal frame stretchers	2
shovels	3
pulaskis	3
$2\frac{1}{2}$ pound rolls of string	17
oil sensitive cards	5
pitchforks	3
brooms	4
fly swatters	3
canteen holders	14
emergency stretcher "Lite -O-Splints"	2
cargo net ropes	7
600 feet of $\frac{1}{4}$" nylon rope	1
spray can handles	6
aprons	9
rubber aprons	2
metal helments	7
folding tables	7
folding chairs	20
swivel chairs	2
wooden chairs	3
5 gallon gas cans	2
plastic flagging, white	128 rolls
plastic flagging, yellow	69 rolls
plastic flagging, red	15 rolls
plastic flagging, blue	13 rolls
plastic flagging, orange	1 rolls
plastic flagging, yellow & white striped	1 rolls

(property inventory con't)

Item	Quantity
tree marking paint (white)	24 cans
cargo parachutes	11
sleeping bags	2
blankets	2
household wax	1 box
drum lifter	1
signal streamers	83
wind indicators	7
reflective vests	6
swivel hooks	4
barrel hook	1
ear plugs	5 packages
paint (blue)	4 cans
paint (white)	3 cans
batteries	1 box
¼" by 4 foot metal rods	18
crowbars	2
portable winch	2
belt type first aid kits	2
bolt cutters	2
single blade axe	2
2½ foot tool boxes	2
nylon string	8 spindles
15 pound CO_2 fire extinguishers	5
chin straps	6
tin snips	2
branch cutters	4
hacksaw	1
hacksaw blades	8
pliers	3
1 foot screwdriver	1
tack hammer	1
wire cutter	1
vicegrip pliers	2
offset screwdrivers	6
offset phillips screwdriver	1
6 inch file	2
10 inch file	2
12 inch file	2
6 foot steel measuring tapes	7
tool boxes	3
handsaws	2
clipboards	10
tow cables	3
towchain	1
overhead projector	1
magnifying lamps	4
chalkboard	1
table lamp	1
mail trays	4
microfilm reader	1

(property inventory con't)

Item	Quantity
light table	1
microscope	2
wooden file cabinet	1
locker	1
freezer	1
garbage cans	2
file index	1
metal tables	2
adding machine	2
typewriter	2
typewriter stand	3
helmets, with radio headsets	5
radios, personal portables	24
radio, base set	1
antennas, portable loop	4
marking cones, rubber	24
calculators, portable	2
chairs, office	5
charcoal	1500 pounds
flashlights	15
burlap bags	2 sacks